

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 14998 (2001): Positive List of Constituents of Melamine-Formaldehyde Resins in Contact with Foodstuffs, Pharmaceuticals and Drinking Water [PCD 12: Plastics]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



भारतीय मानक

संकुचित भाग के सम्पर्क में खाद्य सामग्री, औषधियों और
पेय जल के सम्पर्क में आने वाले मेलामाइन-फोर्मलडीहाइड
रेजिन की संचकित वस्तुओं की निश्चित सूची

Indian Standard

**POSITIVE LIST OF CONSTITUENTS
OF MELAMINE-FORMALDEHYDE RESINS
IN CONTACT WITH FOODSTUFFS,
PHARMACEUTICALS AND DRINKING WATER**

ICS 67.250;83.080.10

© BIS 2001

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Plastics Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

Use of Plastics, and resins in the form of cured moulded articles, in packaging of foodstuffs, pharmaceuticals and drinking water has now become a universally accepted method. In so far as there is any cause for concern in the use of plastics/resins in intimate contact with foodstuffs, etc, it arises from the migration of the constituents of the plastics composition or residues thereof in their original or an altered form. Where direct contact occurs between the packed commodity and the plastics, the high molecular mass polymer itself does not pose toxic hazards being inert and essentially insoluble in food. There is, however, a likelihood that some transfer may occur of polymer additives, adventitious impurities such as monomers, catalyst remnants and residual polymerization solvents and of low molecular mass polymer fractions from the plastics into the packaged material with consequent hazard to the consumers. The occurrence of acute toxicity due to plastics material in contact with food is most unlikely, since only trace quantities of potentially toxic materials are likely to migrate. However, the accumulation of these toxic materials with time may lead to hazards which may be serious.

Melamine-formaldehyde resins commonly known as MF resins are produced by reacting one mole of melamine with not more than three moles of formaldehyde. Part of the melamine fraction may be replaced by urea or by benzoguanamine. The moulding materials of the resin are produced by mixing the resin with refined wood pulp (cellulose) or with untreated wood reduced to particulate form. This mixture may also contain other ingredients/optional adjuvant substances like lubricants and flow promoters, catalysts, polymerization control agents, pigments and colourants.

MF resins has the hardest surface of all plastics materials, the trade-off being its brittleness. They are transparent, but when sufficient filler is added (to overcome the extreme brittleness of the unfilled resin), they become translucent and excellent diffusers of light; the colour possibilities being unlimited. They are having very high resistance to abrasion, acids and alkalis and repeated exposure to liquids. The basic property of its ability to accept a moulded-in-decoration in addition to its having high resistance to direct heat has made it very popular for use in dinnerware, cutlery handles, large serving utensils and bowls, etc, and various other food-contact applications. MF resins can be moulded in flash, semi-positive and positive shut-off compression moulds and can also readily be moulded in transfer and injection moulds.

Melamine-formaldehyde resins in the form of cured moulded articles can be safely used as the food contact surface of moulded articles intended for use in producing, manufacturing, packing, processing, preparing, treating, packaging, transporting or holding foodstuffs, pharmaceuticals and drinking water in accordance with the code of federal Regulations, FDA(USA) (21 CFR 177.1460).

This standard is intended to be used with the series of Indian Standards on plastics for food contact applications which are given in Annex A.

It is emphasized that these standards need to be used in combination to provide a system of control to the resins manufacturers as well as the fabricators to derive maximum benefits. Besides, it may also serve as basis for official agencies to frame suitable legislations to ensure effective safeguards for the safety and health of consumer where plastics in general for food contact applications are concerned.

The composition of the Committee responsible for formulation of this standard is given in Annex B.

The list of additives prescribed in this positive list are based on the information available through published literature like The British Plastics Federation, UK; FDA Regulations, USA; and Synoptic Document (No. 5) on Plastics Materials and Articles intended to come into contact with foodstuffs issued by Commission of the European Communities.

Indian Standard

POSITIVE LIST OF CONSTITUENTS OF MELAMINE-FORMALDEHYDE RESINS IN CONTACT WITH FOODSTUFFS, PHARMACEUTICALS AND DRINKING WATER

1 SCOPE

1.1 This standard covers positive list of constituents of melamine-formaldehyde(MF) resins, namely, manufacturing residues and necessary additives which may be regarded as safe for use, when properly processed, in contact with foodstuffs, pharmaceuticals and drinking water and when present only in the prescribed limits of concentration.

1.2 It does not purport to establish the suitability of the ingredient singly in a particular foodstuff from other than toxicological consideration.

2 REFERENCES

The following standard contains provision which, through reference in this text, constitutes provision of this standard. At the time of publication, the editions indicated was valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below:

<i>IS No.</i>	<i>Title</i>
9833 : 1981	List of pigments and colourants for use in plastics in contact with foodstuffs, pharmaceuticals and drinking water

3 TERMINOLOGY

3.1 Melamine-Formaldehyde Resin

Melamine-formaldehyde resins are those produced when one mole of melamine is made to react with not more than three moles of formaldehyde in water solution. Part of the melamine fraction may be replaced by urea or benzoguanamine.

3.2 Melamine-Formaldehyde Moulding Materials

Melamine-formaldehyde resins mixed with refined wood pulp (cellulose) or with untreated wood reduced to particulate form. This mixture may also contain other optional adjuvant substances like lubricants and

flow promoters, catalysts, polymerization control agents.

4 REQUIREMENTS

4.1 Basic Resin — As defined in 3.1.

4.2 Moulding Materials — As defined in 3.2.

4.3 Manufacturing Residue

4.3.1 Residual Monomers

Moulded articles made from melamine-formaldehyde moulding materials shall, when subjected to the following tests, not yield more than 3 g formaldehyde per 100 mm² of exposed surface in each test.

Moulded or representative mouldings shall be filled with or immersed in a) distilled water, b) 3 percent (W/W) aqueous acetic acid, c) 10 percent (V/V) aqueous ethanol, each at 80°C and allowed to cool at ambient temperature for 30 minutes. The ratio of extractant volume to surface area of the moulding in contact with extractant shall be 1 ml to 100 mm².

The formaldehyde content of the extractant is then measured and the amount extracted per unit surface area obtained by calculation.

4.3.2 Catalyst

The residues of the following products used as catalyst may be present in the basic resin:

- a) Phthalic anhydride; and
- b) Tetrachlorophthalic anhydride.

4.3.3 Polymerization Control Agents

The residues of the following products may be present in the basic resin:

- a) Hexamethylene tetramine; and
- b) Magnesium carbonate.

4.4 Polymerization Ingredients

Polymerization ingredients may be present provided that the manufacturer has obtained the specific approval of concerned authority within any limitations imposed by the authority.

4.5 Auxiliary Items for Working**4.5.1 Lubricants and Flow Promoters**

The total lubricants and flow promoters shall be not more than 3 percent of the finished resin except in those cases wherein it is specifically prescribed.

4.5.1.1 The following lubricants and flow promoters

may be present in MF resins:

- a) Stearic acid;
- b) Zinc stearate; and
- c) Dioctyl phthalate

4.6 Pigments and Colourants

The pigments and colourants used shall comply with the list and limits prescribed in IS 9833.

ANNEX A**(Foreword)**

**LIST OF INDIAN STANDARDS ON PLASTICS SUITABLE FOR USE IN CONTACT WITH
FOODSTUFFS, PHARMACEUTICALS AND DRINKING WATER**

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
9833 : 1981	List of pigments and colourants for use in plastics in contact with foodstuffs, pharmaceuticals and drinking water		contact with foodstuffs, pharmaceuticals and drinking water (<i>first revision</i>)
9845 : 1998	Determination of overall migration of intended to come into contact with foodstuffs — Method of analysis (<i>second revision</i>)	10910 : 1984	Polypropylene and its copolymers for its safe use in contact with foodstuffs, pharmaceuticals and drinking water
10141 : 2001	Positive list of constituents of polyethylene in contact with foodstuffs, pharmaceuticals and drinking water (<i>first revision</i>)	11434 : 1985	Ionomers resins for its safe use in contact with foodstuffs, pharmaceuticals and drinking water
10142 : 1999	Polystyrene (crystal and high impact) for its safe use in contact with foodstuffs, pharmaceuticals and drinking water (<i>first revision</i>)	11435 : 1985	Positive list of constituents of ionomer resins for its safe use in contact with foodstuffs, pharmaceuticals and drinking water
10146 : 1982	Polyethylene for its safe use in contact with foodstuffs, pharmaceuticals and drinking water	11704 : 1986	Ethylene/acrylic acid (EAA) copolymers for its safe use in contact with foodstuffs, pharmaceuticals and drinking water
10148 : 1982	Positive list of constituents of polyvinyl chloride (PVC) and its copolymers in contact with foodstuffs, pharmaceuticals and drinking water	11705 : 1986	Positive list of constituents of Ethylene/acrylic acid (EAA) copolymers for their safe use in contact with foodstuffs, pharmaceuticals and drinking water
10149 : 1982	Positive list of constituents of polystyrene (crystal and high impact) in contact with foodstuffs, pharmaceuticals and drinking water (Amendment No. 1)	12229 : 1987	Positive list of constituents of polyalkylene terephthalates (PET & PBT) for their safe use in contact with foodstuffs, pharmaceuticals and drinking water
10151 : 1982	Polyvinyl chloride (PVC) and its copolymers for its safe use in contact with foodstuffs, pharmaceuticals and drinking water	12247 : 1988	Nylon-6 polymer for its safe use in contact with foodstuffs, pharmaceuticals and drinking water
10171 : 1999	Guide on suitability of plastics for food packaging (<i>second revision</i>)	12248 : 1988	Positive list of constituents of Nylon-6 polymer for its safe use in contact with foodstuffs, pharmaceuticals and drinking water
10909 : 1984	Positive list of constituents of polypropylene and its copolymers in	12252 : 1987	Polyalkylene terephthalates (PET & PBT) for their safe use in contact with foodstuffs, pharmaceuticals and drinking water

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
13449 : 1992	Positive list of constituents of ethylene vinyl acetate (EVA) copolymers in contact with foodstuffs, pharmaceuticals and drinking water	14971 : 2001	Polycarbonate resins for its safe use in contact with foodstuffs, pharmaceuticals and drinking water
13576 : 1992	Ethylene methacrylic and (EMAA) copolymers and terpolymers for their safe use in contact with foodstuffs, pharmaceuticals and drinking water	14972 : 2001	Positive list of constituents of polycarbonate resins in contact with foodstuffs, pharmaceuticals and drinking water
13577 : 1992	Positive list of constituents of ethylene methacrylic (EMAA) copolymers and terpolymers in contact with foodstuffs, pharmaceuticals and drinking water	14996 : 2001	Positive list of constituents of modified poly (phenylene oxide) (PPO) resins in contact with foodstuffs, pharmaceuticals and drinking water
13601 : 1993	Ethylene vinyl acetate (EVA) copolymers for its safe use in contact with foodstuffs, pharmaceuticals and drinking water	14997 : 2001	Modified poly (phenylene oxide) (PPO) resins for its safe use in contact with foodstuffs, pharmaceuticals and drinking water
		14999 : 2001	Melamine-formaldehyde resins for its safe use in contact with foodstuffs, pharmaceuticals and drinking water

ANNEX B

(Foreword)

COMMITTEE COMPOSITION

Plastics Sectional Committee, PCD 12

<i>Organization</i>	<i>Representative(s)</i>
Internet Exchange Next.com Limited, Mumbai	SHRI SARUP CHOWDHARY (<i>Chairman</i>)
Amines and Plasticizers Ltd, Mumbai	SHRI V. V. KULKARNI
	DR R. V. UTEKAR (<i>Alternate</i>)
Bakelite Hylam Ltd, Hyderabad	DR C. S. NARASIMHAN
	DR M. BALAKRISHNAN (<i>Alternate</i>)
Building Materials and Technology Promotion Council, New Delhi	SHRI J. SENGUPTA
Central Institute of Plastics Engineering and Technology, Chennai	DR VIJAI KUMAR
	DR K. PALANIVELU (<i>Alternate</i>)
Central Food Technological Research Institute, Mysore	SHRI S. K. KUMAR
	SHRI BALDEV RAJ (<i>Alternate</i>)
Gas Authority of India Ltd, Noida	SHRI SHIVAJI BASU
	SHRI V. K. SINGH (<i>Alternate I</i>)
	SHRI MANISH KHANDLWAL (<i>Alternate II</i>)
Gharda Chemcials Ltd, Thane	DR B. K. DESAI
	DR U. M. VAKIL (<i>Alternate</i>)
GE Plastics India Limited, Gurgaon	GENERAL MANAGER
	DR RASHMI BHARDWAJ (<i>Alternate</i>)
Gujarat State Fertilizers Company Limited, Vadodara	SHRI B. D. ADHVARYU
	DR Y. P. SINGH (<i>Alternate</i>)
Haldia Petrochemicals Ltd, Kolkata	SHRI SHANKAR BANERJEE
	SHRI AMITAVA SANYAL (<i>Alternate</i>)
Hindustan Polymers Ltd, Mumbai	SHRI S. V. PARVEEN
	SHRI N. C. DHOCENDRANATH (<i>Alternate</i>)
Indian Centre for Plastics in Environment, Mumbai	DR A. N. BHAT
Indian Petrochemicals Corporation Limited, Vadodara	SHRI J. B. KAMAT
	SHRI V. C. FRANCIS (<i>Alternate</i>)
Indian Plastics Institute, Mumbai	SHRI D. R. PATEL
	SHRI R. K. AGGARWAL (<i>Alternate</i>)
Indian Institute of Packaging, Mumbai	SHRI P. V. NARAYANAN
	DR N. G. MOKASHI (<i>Alternate</i>)
Indian Toxicological Research Centre, Lucknow	DR V. P. SHARMA
Jain Irrigation Systems Ltd, Jalgaon	DR H. C. MRUTHYUNJAYA
	SHRI S. B. JOSHI (<i>Alternate I</i>)
	SHRI A. P. CHOUDHARI (<i>Alternate II</i>)
Larsen & Toubro Ltd, Mumbai	SHRI V. MOHAN
	SHRI R. SUBA RAO (<i>Alternate</i>)
Ministry of Defence (R&D), Kanpur	SHRI M. N. SARAF
	DR L. D. KHANDPAL (<i>Alternate</i>)
Ministry of Defence, RDSO, Lucknow	JOINT DIRECTOR (RUBBER)
	DIRECTOR (SS) (<i>Alternate</i>)
Ministry of Health and Family Welfare, DGHS, New Delhi	ADDL DIRECTOR GENERAL (PFA)
	SHRI SUNDAR LAL (<i>Alternate</i>)
Ministry of Food Processing Industries, New Delhi	SHRI O. P. GERA
National Chemical Laboratory, Pune	DR S. S. MAHAJAN
	DR S. S. KULKARNI (<i>Alternate</i>)
National Dairy Development Board, Anand	DR R. S. LATHANA
	SHRI S. K. KHANDLWAL (<i>Alternate</i>)
National Organic Chemical Industries Ltd, Mumbai	SHRI V. K. SHARMA
	SHRI J. K. VADODARIA (<i>Alternate</i>)
Nuchem Ltd, Faridabad	DR R. M. MEHTA
Permal Wallace Ltd, Bhopal	SHRI C. C. SAKARDA
	SHRI S. K. KODESIA (<i>Alternate</i>)
Reliance Industries Ltd, Mumbai	DR Y. B. VASUDEO
	DR K. S. JADHAV (<i>Alternate</i>)
Saint-Gobain Vetrotex India Ltd, Hyderabad	SHRI S. SUNDARAM
	SHRI S. K. GHOSH (<i>Alternate I</i>)
	DR B. J. C. BASU (<i>Alternate II</i>)
Shivalik Agro-Poly Products Ltd, Parwanoo, H.P.	SHRI ARUN ANAND
	SHRI YOG RAJ KAPUR (<i>Alternate</i>)
Shriram Fertilizers & Chemcials, Kota	SHRI M. S. TRIPATHI
	SHRI R. C. GUPTA (<i>Alternate</i>)
Shriram Institute for Industrial Research, Delhi	DR R. C. SOOD

(Continued on page 5)

(Continued from page 4)

<i>Organization</i>	<i>Representative(s)</i>
Supreme Petrochem Ltd, Mumbai	SHRI R. RANGARAJAN SHRI B. A. RAKHANGI (<i>Alternate</i>)
The All India Plastics Manufacturers Association, Mumbai	SHRI R. K. AGGARWAL SHRI K. B. EASWARAN (<i>Alternate</i>)
Tata Engineering & Locomotive Co Ltd, Jamshedpur	SHRI U. K. NATH SMT A. D. SATHE (<i>Alternate</i>)
The Plastics & Linoleums Export Promotion Council, Mumbai	SHRI R. P. KALYANPUR SHRI SIDDHARTHA ROY SHRI A. S. DALVE (<i>Alternate</i>)
VIP Industries, Mumbai	SHRI C. BHASKAR SHRI MANMOHAN KRISHAN (<i>Alternate</i>)
XPRO India Ltd, Faridabad	SHRI ANJAN KAR, Director & Head (PCD) [Representing Director General (<i>Ex-officio Member</i>)]
BIS Directorate General	

Member-Secretary
SHRI T. KALAIVANAN
Joint Director (PCD), BIS

Plastics in Food Packaging and Allied Industries Subcommittee, PCD 12:12

Central Food Technological Research Institute, Mysore	SHRI K. R. KUMAR (<i>Convener</i>)
All India Plastic Industries Association, Delhi	SHRI RAVI KUMAR
AS & T India Limited, New Delhi	SHRI G. D. AGRAWAL
Bakelite Hylam Ltd, Mumbai	DR C. SANKAR SHRI S. N. MURTHY (<i>Alternate</i>)
Britannia Industries Ltd, Bangalore	SHRI G. S. AURORA SHRI M. R. SUNDAR (<i>Alternate</i>)
Centre for Processed Food, Bangalore	SHRI R. PRAKASH SHRI CHETAN L. HANCHATE (<i>Alternate</i>)
Central Committee for Food Standards (Directorate General of Health Services), New Delhi	THE ASSTT DIRECTOR GENERAL (PFA)
Central Food Laboratory, Kolkata	DR K. C. GUHA DR S. VANCHINATHAN (<i>Alternate</i>)
Defence Food Research Laboratory, Mysore	SHRI ANIL AGARWAL SHRI A. N. SRIVASTAVA (<i>Alternate</i>)
Drugs Controller (India), New Delhi	DR P. DAS GUPTA
GE Plastics India Limited, Distt Vadodara	DR G. MUKHOPADHAYA DR RASHMI BHARDWAJ (<i>Alternate</i>)
Gujarat State Fertilizers Company Limited, Vadodara	SHRI B. D. ADHVARYU DR Y. P. SINGH (<i>Alternate</i>)
Haldia Petrochemicals Ltd, Kolkata	SHRI AMITAVA SANYAL SHRI RAJ DATTA (<i>Alternate</i>)
Hindustan Lever Ltd, Mumbai	SHRI M. K. LAHIRI SHRI P. S. LAKSHMANAN (<i>Alternate</i>)
Hitkari Potteries Ltd, New Delhi	SHRI MILIND BHOLE
Indian Institute of Packaging, Mumbai	MS M. C. DORDI SHRI N. C. SAHA (<i>Alternate</i>)
Indian Petrochemicals Corporation Limited, Vadodara	SHRI J. B. KAMAT SHRI V. C. FRANCIS (<i>Alternate</i>)
Indian Toxicological Research Centre, Lucknow	DR P. K. SETH
National Dairy Development Board, Anand	SR EXECUTIVE
National Organic Chemicals Industries Ltd, Mumbai	SHRI J. K. VADODARIA SHRI V. K. SHARMA (<i>Alternate</i>)
Reliance Industries Ltd, Mumbai	DR K. S. JADHAV DR R. RANGAPRASAD (<i>Alternate</i>)
Rollantainers Ltd, Faridabad	SHRI SANJAYA VARMA
Shriram Fertilizers & Chemicals, Kota	SHRI M. S. TRIPATHI SHRI R. C. GUPTA (<i>Alternate</i>)
Supreme Petrochem Ltd, Mumbai	SHRI R. RANGARAJAN SHRI B. A. RAKHANGI (<i>Alternate</i>)
XPRO India Ltd, Faridabad	SHRI PANKAJ MITHEL SHRI VINEET GUPTA (<i>Alternate</i>)

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 1986* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc : No. PCD 12 (1331).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110 002
Telephones : 323 01 31, 323 33 75, 323 94 02

Telegrams : Manaksanstha
(Common to all offices)

Regional Offices :

	Telephone
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110 002	{ 323 76 17 323 38 41
Eastern : 1/14 C.I.T. Scheme VII M, V. I. P. Road, Kankurgachi KOLKATA 700 054	{ 337 84 99, 337 85 61 337 86 26, 337 91 20
Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160 022	{ 60 38 43 60 20 25
Southern : C.I.T. Campus, IV Cross Road, CHENNAI 600 113	{ 254 12 16, 254 14 42 254 25 19, 254 13 15
Western : Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400 093	{ 832 92 95, 832 78 58 832 78 91, 832 78 92
Branches : AHMEDABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. NAGPUR. NALAGARH. PATNA. PUNE. RAJKOT. THIRUVANANTHAPURAM.	